

## BATHTUB AND SHOWER THRESHOLD

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### BACKGROUND OF THE INVENTION

#### 1. *Field of the Invention*

The invention relates generally to bathtubs and shower enclosures.

#### 2. *Description of Prior Art and Related Information*

10       Conventional bathtubs and shower enclosures generally employ shower curtains or sliding doors which attempt to block water from exiting the enclosures. The sliding doors are generally disposed on tracks placed on a horizontal tub threshold over which a user enters and exits the tub. In shower stalls, revolving doors are typically employed. A generally shorter threshold is provided, and a typical revolving door is  
15       adapted to rotate to a closed position located above the threshold.

          In both conventional bathtub enclosures, shower stalls, shower pans, or receptors, a high potential exists for water to collect along the threshold area. In bathtubs having sliding doors, such problems may arise from an insufficient sealing between the tracks and the threshold as well as from the usual wear-and-tear that  
20       would cause an originally sufficient seal to degrade. In shower stalls, a typical threshold collects water because of dripping from the shower door as well as from drops landing directly thereon. The water collected on the threshold tends to leak out onto the bathroom floor, and may result in serious and costly home damage. For example, common problems include rot and mold as a result of water running onto the floor.

Fixing these problems tend to be very costly since replacement of the bathroom flooring may often be required. Homeowners also tend to refrain from filing insurance claims for water damage because the consequence of filing such a claim can typically ruin one's chances of obtaining homeowner's insurance in the future.

- 5           What is needed is an inexpensive method and apparatus for preventing leaks from bathtubs and shower stalls.

## SUMMARY OF THE INVENTION

In accordance with the present invention, structures and associated methods are disclosed which address these needs and overcome the deficiencies of the prior art.

In one aspect, a bathtub is provided. The bathtub comprises a reservoir, a  
5 threshold having an outer edge and an inner edge, and a slope included in the threshold  
and configured to direct water away from the outer edge toward the inner edge. The  
slope comprises a run-off surface facing upwardly and inwardly. The run-off surface is  
substantially flat. The threshold comprises a substantially horizontal surface between  
the slope and the inner edge. The slope comprises an outer portion with a height  
10 between .25 inch to 1 inch from the substantially horizontal surface. The slope  
comprises a transverse span between 0.5 inch to 3 inches. The slope comprises an  
angle between 2 to 85 degrees with respect to the substantially horizontal surface.

In another aspect, a shower base assembly is provided for use in connection with  
a shower enclosure or shower stall. The assembly comprises a bottom floor, an inner  
15 side portion adapted to be disposed adjacent an inner wall of the shower enclosure, a  
front side portion adapted to be disposed adjacent to a front wall of the shower  
enclosure, a rear side portion adapted to be disposed adjacent to a rear wall of the  
shower enclosure, and a threshold portion including an outer edge, an inner edge and a  
slope configured to direct water from the outer edge toward the inner edge.

20 The slope comprises a run-off surface facing upwardly and inwardly. The run-off  
surface is substantially flat. The threshold comprises a substantially horizontal surface  
between the slope and the inner edge. The slope comprises an outer portion with a  
height between .25 inch to 1 inch from the substantially horizontal surface. The slope

comprises a transverse span between 0.5 inch to 3 inches. The slope comprises an angle between 2 to 85 degrees with respect to the substantially horizontal portion.

In another aspect, a slope is provided for use in connection with an existing bathtub threshold or shower base threshold. The slope comprises a length, an outer  
5 portion disposed substantially along the length and having a first height, an inner portion disposed substantially along the length and having a second height that is less than the first height, and a slope descending from the outer portion to the inner portion.

A method is also provided for preventing leakage from a bathing area, which area may include a bathtub or shower enclosure. The method comprises the steps of  
10 providing a threshold disposed adjacent to an outer side of the area, providing the threshold with a slope that declines as it extends inwardly, receiving water with the threshold, and directing the water away from an exterior of the area and toward an interior of the area with the slope.

In summary, a threshold for a bathtub or shower base assembly includes a slope  
15 configured to direct water away from an exterior toward an interior of the tub or assembly. The slope declines as it extends inwardly, thereby preventing water from leaking to the floor. The slope includes an outer portion that is higher than an inner portion, and a surface in between that faces upwardly and inwardly. The slope is disposed along an axial length of an outer side of the tub or base assembly. The slope  
20 is disposed outwardly of a horizontally flat surface which, in a tub, may be configured for supporting a sliding door.

The invention, now having been briefly summarized, may be better visualized by turning to the following drawings wherein like elements are referenced by like numerals.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cutaway, perspective view of a preferred embodiment of a bathtub according to the invention;

FIG. 2 is a close-up, cross-sectional view of the preferred embodiment of the bathtub in FIG. 1;

FIG. 3 is a cutaway, perspective view of a preferred embodiment of a shower base assembly according to the invention; and

FIG. 4 is close-up, cross-sectional view of the preferred embodiment of the shower base assembly in FIG. 3;

FIG. 5 is an exploded view of a preferred embodiment of a threshold being retrofitted onto an existing bathtub; and

FIG. 6 is an exploded view of a preferred embodiment of a threshold being retrofitted onto an existing shower base.

The invention and its various embodiments can now be better understood by turning to the following detailed description wherein illustrated embodiments are described. It is to be expressly understood that the illustrated embodiments are set forth as examples and not by way of limitations on the invention as ultimately defined in the claims.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS AND BEST MODE OF INVENTION

A preferred embodiment of a bathtub according to the invention is illustrated in Figures 1 and 2, and designated generally by the reference numeral 10. The tub 10 comprises a front side 12 adjacent to a shower head 13, an opposite rear side 14, an inner side 16, and an outer side 18 whereby a user enters and exits the tub 10. The outer side 18 includes a tub threshold 21 of particular interest to the invention. The tub 10 includes an exterior 23, and an interior, or reservoir, 25 defined by an enclosed vertical sidewall 27 and a bottom floor 29.

10 It is to be understood that the preferred embodiment of the tub 10 may be adapted for use with shower curtains and sliding door enclosures. In Figures 1 and 2, the tub threshold 21 includes an inner edge 32 and an outer edge 34. A slope 36 disposed adjacent to the outer edge 34 of the tub threshold 21 is located substantially along a length of the tub 10 between the front side 12 and the rear side 14. The slope 36 is configured to direct water away from the exterior 23 toward the interior 25 of the tub 10. In particular, the slope 36 comprises an outer portion 38 with a first height 41 that is higher than a second height 43 of an inner portion 45, such that the slope 36 declines as it extends inwardly toward the interior 25. Alternatively stated, the slope 36 inclines as it extends outwardly toward the exterior 23. In a further aspect, the slope 36 faces upwardly and inwardly. In the preferred embodiment, the outer portion 38 defines a peak of the slope 36 that also forms the outer edge 34 of the threshold 21.

In the illustrated embodiment shown in Figures 1 and 2, the threshold 21 includes a substantially flat surface 47 disposed interiorly of the slope 36. This surface 47 is

preferably adapted for supporting a sliding door enclosure. Though the surface 47 is illustrated as substantially horizontal, it should be understood that the surface 47 comprises a slight draft, or slant, that extends downwardly and inwardly towards the reservoir 25 to direct water thereto. Thus, the slope 36 is preferably disposed exterior  
5 to any sliding door enclosure so that any water leaking from the sliding door enclosure is prevented from exiting the tub 10.

As an example and not by way of limitation, the first height 41 of the slope 36 with respect to the surface 47 may comprise a range preferably between 1/8 inch to 2 inches. As a further example, the slope 36 may comprise a transverse width span "W"  
10 between its outer portion 38 and inner portion 45 in the range of 0.5 inch to 3 inches. In the preferred embodiment where the inner portion 45 of the slope 36 is flush with the surface 47, the second height 43 with respect to the surface 47 is thus zero. The slope 36 preferably has an angle 49 with respect to the surface 47 between 2 to 85 degrees. It is to be expressly understood that these ranges are being provided as examples of  
15 preferred embodiments, and are not intended to limit the scope of the invention.

Alternatively, a shower curtain may be employed. In either case, it will be appreciated that the threshold 21 prevents leakage during showering by directing any water thereon away from the exterior 23 toward the interior 25 of the tub 10. In particular, the slope 36 provides a slanted runoff surface that causes any water thereon  
20 to move toward the interior 25 of the tub 10, thereby preventing leakage outside the tub 10.

In Figures 3 and 4, a preferred embodiment of a shower stall enclosure 100, and, more particularly, a shower base assembly, or shower pan, 110, operate to prevent

leakage. It is to be expressly understood that the shower base assembly 110 may be formed separately or in combination with an entire shower stall enclosure 100. In particular, the base assembly 110 comprises a front side 112 adjacent to a shower head 113, an opposite rear side 114, an inner side 116, and an outer side 118 whereby a user enters and exits the shower stall enclosure 100. The outer side 118 includes a shower threshold 121 of particular interest to the invention. The shower base assembly 110 includes an exterior 123, and an interior 125, or reservoir, defined by an enclosed vertical sidewall 127 and a bottom floor 129.

In Figures 3 and 4, the shower threshold 121 includes an inner edge 132 and an outer edge 134. A slope 136 disposed adjacent to the outer edge 134 of the shower threshold 121 is disposed between the front side 112 and the rear side 114. The slope 136 is configured to direct water away from the exterior 123 toward the interior 125 of the shower base assembly 110. In particular, the slope 136 comprises an outer portion 138 with a first height 141 that is higher than a second height 143 of an inner portion 145, such that the slope 136 declines as it extends inwardly toward the interior 125. Alternatively stated, the slope 136 inclines as it extends outwardly toward the exterior 123. In a further aspect, the slope 136 faces upwardly and inwardly. In the preferred embodiment, the outer portion 138 defines a peak of the slope 136 that also forms the outer edge 134 of the threshold 121.

In the illustrated embodiment shown in Figures 3 and 4, the threshold 121 includes a substantially flat, horizontal surface 147 disposed interiorly of the slope 136. and adapted to lie beneath a shower door when closed. Thus, the slope 136 is preferably disposed exterior to a shower door so that any water dripping from the



shower door is prevented from exiting the shower stall enclosure 100, including the shower base assembly 110.

As an example and not by way of limitation, the first height 141 of the slope 136 may comprise a range preferably between 1/8 inch to 2 inches with respect to the horizontal surface 147. As a further example, the slope 136 may comprise a transverse width "W" between its outer portion 138 and inner portion 145 in the range of 0.5 inch to 3 inches. In the preferred embodiment where the inner portion 145 of the slope 136 is flush with the surface 147, the second height 143 with respect to the surface 147 is thus zero. The slope 136 preferably has an angle 149 with respect to the surface 147 between 2 to 85 degrees. It is to be expressly understood that these ranges are being provided as examples of preferred embodiments, and are not intended to limit the scope of the invention.

It will be appreciated that the threshold 121 prevents leakage during showering by directing any water thereon away from the exterior 123 toward the interior 125 of the shower base assembly 110. In particular, the slope 136 provides a slanted runoff surface that causes any water thereon to move toward the interior 125 of the shower base assembly 110, thereby preventing leakage outside the shower base assembly 110.

Furthermore, it should be understood that the each of the tub threshold 21 and shower threshold 121 may be provided as a separate unit that may be retrofitted onto an existing tub or shower, respectively. Therefore, in Figure 5, a preferred embodiment of the tub threshold 21 may be coupled onto an existing tub threshold 160. As shown in phantom lines, the tub threshold 21 is disposed on over an outer portion 162 of the

existing threshold 160 adjacent to an exterior 23 of the tub. In Figure 6, a preferred embodiment of the shower threshold 121 may be coupled onto an existing shower threshold 164. As shown in phantom lines, the shower threshold 121 is disposed over an outer portion 166 of the existing shower threshold 164. These retrofit, or  
5 aftermarket, thresholds 21, 121 may comprise all the features previously disclosed above in connection with the preferred embodiments 21, 121 shown in Figures 1–4, except for the substantially horizontal surface 47 (shown in Figures 1–4) which is optional due to the surface already provided by the existing bathtub threshold 160 and shower threshold 164.

10 Many alterations and modifications may be made by those having ordinary skill in the art without departing from the spirit and scope of the invention. Therefore, it must be understood that the illustrated embodiments have been set forth only for the purposes of examples and that they should not be taken as limiting the invention as defined by the following claims. For example, notwithstanding the fact that the elements  
15 of a claim are set forth below in a certain combination, it must be expressly understood that the invention includes other combinations of fewer, more or different ones of the disclosed elements.

The words used in this specification to describe the invention and its various embodiments are to be understood not only in the sense of their commonly defined  
20 meanings, but to include by special definition in this specification the generic structure, material or acts of which they represent a single species.

The definitions of the words or elements of the following claims are, therefore, defined in this specification to not only include the combination of elements which are

literally set forth. In this sense it is therefore contemplated that an equivalent substitution of two or more elements may be made for any one of the elements in the claims below or that a single element may be substituted for two or more elements in a claim. Although elements may be described above as acting in certain combinations  
5 and even initially claimed as such, it is to be expressly understood that one or more elements from a claimed combination can in some cases be excised from the combination and that the claimed combination may be directed to a subcombination or variation of a subcombination.

Insubstantial changes from the claimed subject matter as viewed by a person  
10 with ordinary skill in the art, now known or later devised, are expressly contemplated as being equivalently within the scope of the claims. Therefore, obvious substitutions now or later known to one with ordinary skill in the art are defined to be within the scope of the defined elements.

The claims are thus to be understood to include what is specifically illustrated  
15 and described above, what is conceptionally equivalent, what can be obviously substituted and also what incorporates the essential idea of the invention.